REVIEW

Acupuncture and low-level laser therapy to support breastfeeding in women with breast pain: a systematic review

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Abstract

Objectives: to analyze the effectiveness of acupuncture and laser therapy, either alone or in combination, in supporting and promoting breastfeeding, including their effects on pain reduction and wound healing.

Methods: a systematic review was conducted using the PubMed, LILACS, IBECS, and BDENF databases through the Virtual Health Library (VHL), as well as SciELO. Search descriptors were guided by the PRISMA methodology. Studies evaluating acupuncture and/or low-level laser therapy in the context of breastfeeding support were included.

Results: The reviewed studies assessed outcomes such as the reduction of breast pain associated with inflammatory symptoms, breast engorgement, milk production, and exclusive breastfeeding rates. Acupuncture was evaluated using different techniques, including needle acupuncture, Gua Sha, and Tuina. Low-Level Laser Therapy (LLLT) led to pain reduction in two clinical trials. However, one study found no difference between laser therapy and the control group regarding pain reduction in women with nipple trauma after a single local application.

Conclusions: the findings of this review indicate limited and heterogeneous evidence regarding breast pain reduction and breastfeeding support. Current evidence relies on a small number of clinical trials with small sample sizes, heterogeneous interventions, and distinct protocols, which precludes robust inferences or clinical recommendations. Further studies with rigorous methodological designs and standardized interventions are essential to clarify the role of these therapies in the clinical breastfeeding practice.

Key words *Breastfeeding, Mastodynia, Systematic review, Acupuncture, Low-level Laser therapy baixa intensidade*

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Introduction

Breastfeeding and its related problems have been widely addressed in public policies and academic literature over the years; however, gaps in research persist, and early weaning remains a reality in Brazil.[1] Public policies and the various promotional initiatives over recent decades have contributed to a significant increase of exclusive breastfeeding (EBF) prevalence among infants under six months of age, which from 2.9% in 1986 to 37.1% in 2006. This trend plateaued in 2013 (36.6%), a concerning stabilization that underscores the need to review and develop new strategies for fostering EBF.[2]

Studies with different methodologies point to various risk factors associated with breastfeeding, including smoking, mode of delivery, maternal educational attainment, a lack of breastfeeding counseling, and the absence of skin-to-skin contact between mother and newborn. Furthermore, clinical conditions such as breast engorgement, flat or inverted nipples, abrasions, and erythema also represent significant risk factors for breastfeeding difficulties and early weaning.[3,4,5] The most frequent problems associated with breastfeeding and early weaning relate to difficulties with the correct breastfeeding techniques, specifically regarding the baby positioning at the breast and incomplete breast emptying. Improper breastfeeding techniques and positions contribute to increased trauma, abrasions, lesions, pain and nipple infections, as well as breast engorgement, clogged ducts, and mastitis.[6] During the first days, it is essential for the postpartum woman receives technical and emotional support to ensure satisfactory breastfeeding; therefore, counseling by a qualified professional during the immediate puerperium is crucial.[7]

Maternal counseling consists of an effective dialogue between health professional mothers concerning breastfeeding, providing support for management and addressing concerns. This counseling promotes breastfeeding starting in the prenatal period, which serves as an excellent opportunity to motivate women to breastfeed.[8] In addition to maternal counseling to support EBF, new interventions and technologies have been incorporated over time into the *Sistema Único de Saúde* (SUS) (Brazilian Public Health System). Initiatives such as the Baby-Friendly Hospital Initiative (BHFI), along with the promotion of best practices in childbirth and perinatal care, have contributed to improving the support provided to women for successful breastfeeding.[7]

Technologies such as acupuncture and low-level laser therapy are seldom discussed and incorporated within SUS; however, a few studies have already pointed to potential benefits regarding the effectiveness of these practices in improving trauma and pain, as well as in supporting breastfeeding.[9-12]

Acupuncture is defined as the insertion of needles (primarily) into specific points along energy channels or meridians to balance the body; it is one of the techniques used in Traditional Chinese Medicine (TCM). Complementing acupuncture, TCM uses techniques such as tuina, gua-sha, cupping therapy, and moxibustion, which are also based on meridians and acupuncture points, distinguishing them from herbal medicine and other therapeutic strategies within Chinese medicine.[13] Acupuncture assists in general pain management, and has demonstrated benefits on breastfeeding.[14,15] TCM and acupuncture have been recognized by the SUS under the National Policy of Integrative and Complementary Practices as early as 2006, with their implementation, service expansion and effectiveness research serving as key objectives for the development of these practices in the country.[16]

The low-level laser therapy (LLLT) is not classified as an integrative practice; however, it may be used in conjunction with acupuncture. Low-level laser induces the healing process by acting on cellular metabolism, increasing granulation tissue, and reducing inflammatory mediators, thereby promoting collagen synthesis, tissue growth factors, revascularization, and pain relief.[9,17] The aim of this systematic review is to identify studies assessing the effectiveness of acupuncture and laser therapy, whether combined or not, in breastfeeding support, with the objective of understanding the effects of low-level laser therapy and acupuncture on breast pain and other breastfeeding-related challenges.

Methods

A systematic review was conducted to analyze publications investigating the use of acupuncture and/or low-level light therapy, either as standalone interventions or in combination, and their effectiveness in relieving breast pain and breastfeeding. Studies were included if they involved women practicing exclusive or mixed breastfeeding, with the intention to exclusively breastfeed, who presented with breast pain or other breastfeeding-related issues. The outcomes of interest were breast pain reduction and adherence to exclusive breastfeeding (EBF). The review followed the PRISMA 2020[18] recommendations and is derived from the master's thesis of one of the authors, developed within the Graduate Program in Collective Health of the Federal University of Paraíba. The review protocol is registered on the OSF platform (10.17605/OSF.IO/T89BY).

Research question:

"*In lactating women with breast pain or breastfeeding-related issues, does the application of acupuncture and/or low-level laser therapy (either alone or in combination), compared to standard care, placebo, or no intervention, improve exclusive breastfeeding adherence and reduce pain*?"

PICO structure:

- P (Population): Lactating women with breast pain or breastfeeding-related issues.
- I (Intervention): Acupuncture and/or LLLT (either alone or in combination).
- C (Comparison): Standard care, placebo, or no intervention.
- O (Outcomes): Adherence to exclusive breastfeeding and pain reduction.

The included controlled clinical trials were those investigating the application of acupuncture and/or low-level light therapy as breastfeeding-supporting strategies for lactating women with breast pain or other breastfeeding-related issues, aiming at maintaining or returning to exclusive breastfeeding (EBF) in full-term infants. Complementary techniques were included if they were based on the acupuncture meridian system, such as acupuncture, tuina, gua-sha, and acupressure. Observational studies (cohorts, case series, or case reports), theses or dissertations without primary data, studies lacking a control group, and TCM interventions that did not utilize the meridian system (e.g., herbal medicine or diet therapy were excluded. Additionally, studies were excluded if essential methodological data could not be obtained (e.g., lack of description of the randomization process, absence of statistical analysis, or incomplete data for the outcomes of interest).

Bibliographic searches were performed on October 15, 2025, in the PubMed/MEDLINE, LILACS, IBECS and BDENF databases, via the Virtual Health Library (VHL), as well as in the SciELO database. The complete search strategies – like Boolean operators, indexing fields and parenthesis – are presented in Supplemental Chart 1 (Chart S1), allowing for the full reproduction of the search process. No restrictions were applied regarding the year of publication. Studies published in Portuguese, English, Spanish, Italian, and French were considered. When available on the platforms, human studies were prioritized. Study selection began with the manual identification and removal of duplicates by comparing titles, authors, publication years, and journals. Following deduplication, unique records were screened based on titles and abstracts. Study selection was conducted independently by three reviewers, based on predefined inclusion and exclusion criteria. The selection process occurred in two stages: (1*) Title and abstract screening* and *(2) full-text review of potentially eligible articles.* The number of records identified, duplicated, excluded, and included is shown in the PRISMA flowchart (Figure 1), in accordance with the methodological description.

Furthermore, the risk of bias assessment of included studies was conducted independently by three reviewers using the Cochrane Collaboration's Risk of Bias 2 (RoB 2) tool for randomized clinical trials (Figure 2). Any disagreements among the reviewers were resolved by consensus. The RoB 2 tool assesses five domains: *1) Randomization process, (2) Deviations from intended interventions, (3) Missing outcome data, (4) Measurement of the outcome, and (5) Selection of the reported results (*Figure 2).

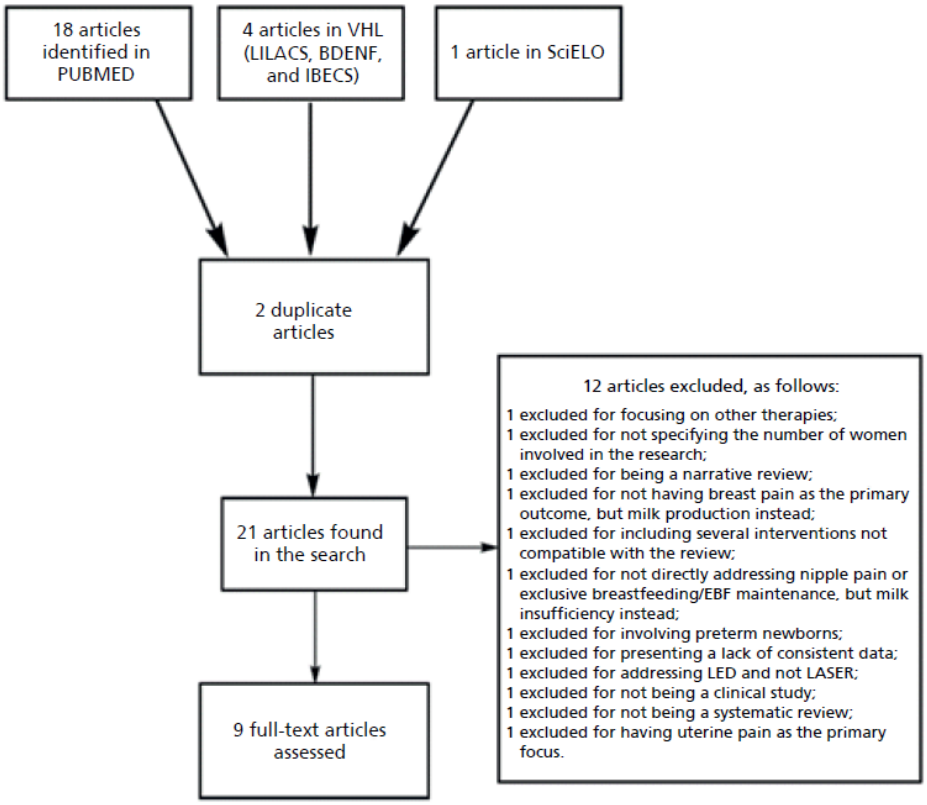
Each domain was classified as low risk of bias, some concerns, or high risk of bias, according to RoB 2 guidelines.[19] The overall risk of bias judgement for each study was determined hierarchically, strictly adhering to the tool's recommendations: studies with at least one domain classified as high risk of bias were judged to have an overall high risk of bias; studies with no domains at high risk, but at least one domain classified as some concerns were judged as having some concerns; and only studies with all domains classified as low risk of bias were considered to have a low risk of bias. The detailed results of this analysis, including the justification for each judgement, are presented in Supplemental Chart 1, ensuring the transparency and reproducibility in the systematic review.

Results

The systematic review search yielded a total of 23 articles. After removing duplicates, 21 studies remained for title and abstract screening, leading to the exclusion of 12 studies for not meeting the inclusion criteria. Thus, the final selection comprised nine articles. Although the included studies presented significant results regarding the use of acupuncture and laser therapy in the context of breastfeeding, significant heterogeneity among methodological designs, sample sizes, and assessment tools. This variability limits the strength of evidence and hinders direct comparison between findings. 12 studies were excluded for the following reasons: they did not address acupuncture meridians and points or laser therapy; they did not involve the target population; or they presented methodological issues (*one study used secondary data without detailing sampling process, and another study had an inadequate sample with potential*

Figure 1

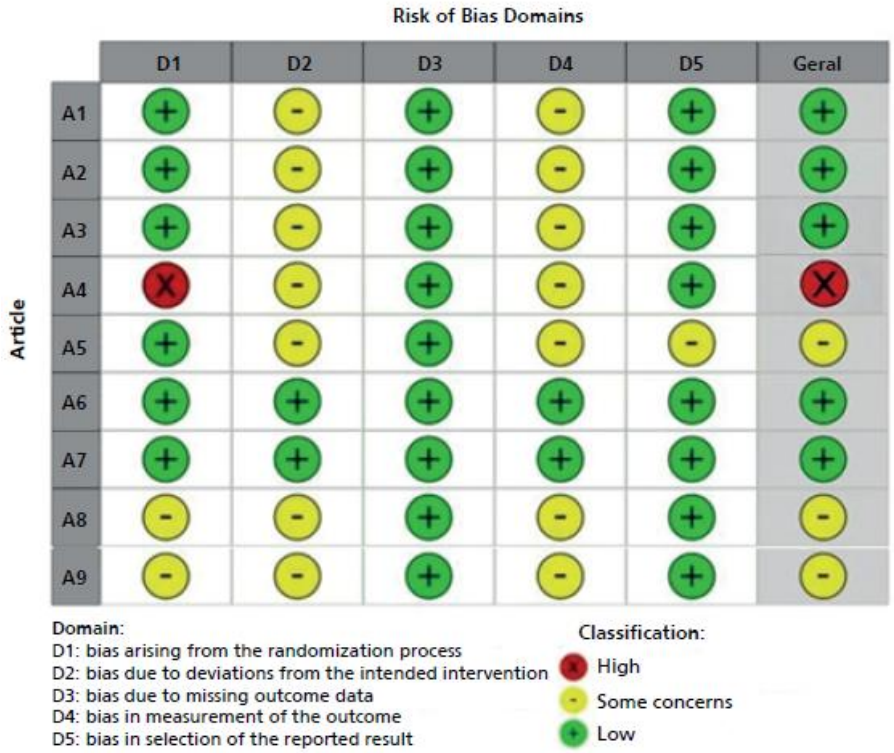
Flowchart of study selection and eligibility.



VHL= Virtual Health Library; EBF= exclusive breastfeeding.

Figure 2

Summary of risk of bias assessment of included studies, according to the Cochrane Collaboration's RoB 2 tool.



bias) (Figure 1). There were no disagreements among reviewers during the selection process. Study selection was conducted in two stages: *title and abstract screening,* followed by *full-text review of potentially eligible articles*. The process was conducted independently by the reviewers, and any disagreements were resolved by consensus, without the use of reference management software or automated tools.

A total of 756 women were evaluated, with sample sizes ranging from 52 to 205 participants. Methodological designs, interventions, assessed outcomes, and follow-up periods were heterogeneous. No study directly compared acupuncture and laser therapy, nor did any assess the combined effect of these interventions. The analyzed outcomes included breast pain reduction, improvement of inflammatory symptoms, breast engorgement, nipple lesion healing, milk production, and adherence to exclusive breastfeeding. Table 1 summarizes the general representation of the characteristics of the included studies, while Table 2 systematically presents quantitative data by study and outcome, including the number of participants per group, outcome definition and scales, measurement timing, group statistics, and effect measures with their respective 95% confidence intervals, when available.

Study A1[10] analyzed 80 women with breast pain, equally distributed between the control and intervention groups. Both groups received standard hospital care, and the intervention group also underwent tuina massage for two consecutive days, starting 48 hours postpartum. Milk production was monitored through direct and indirect measures, including the volume produced. Higher mean milk production was observed 24 and 48 hours after the intervention in the tuina massage group compared to the control group, whereas no significant difference existed between the groups at baseline.

In study A2,[20] 54 postpartum women with breast engorgement were allocated into control and intervention groups; the former received conventional treatment, while the latter received conventional treatment combined with gua-sha therapy. Engorgement, pain, and breast and body temperature scores were assessed. The intervention group showed a greater mean reduction in these scores throughout the follow-up period compared to the control group.

The publication A3[21] analyzed 88 lactating women with inflammatory breast symptoms who sought care at breastfeeding clinics. Participants were randomized into three groups: the first received conventional treatment combined with oxytocin spray; the second received acupuncture at the HT3 and GB21 points; and the third received acupuncture at the HT3, GB21, and SP6 points. No significant differences were observed between groups regarding the severity index of the inflammatory process, breastfeeding satisfaction, or response over time.

In the clinical trial A4[14], five lactating women reporting inflammatory breast processes were randomly assigned to three groups; all participants received standard treatment, supplemented with either oxytocin spray or acupuncture using different point combinations. A greater reduction in the severity index of the inflammatory process was observed in the acupuncture groups, as well as a reduced need for antipyretics and warm compresses, compared to the group using oxytocin spray alone.

The study A5[11] evaluated 84 lactating women, with 43 in the control group and 41 in the intervention group. The intervention group received acupuncture sessions twice a week for three weeks. The analysis was based on a semi-structured questionnaire administered during the study, after the third week of intervention and at the infant's three-month follow-up. The newborn's growth rate, the need for infant formula supplementation, and a subjective assessment of breastfeeding satisfaction were explored. In this study, the proportion of women adhering to breastfeeding was higher in the acupuncture group at both the three-week and three-month marks; raw data by group and the corresponding effect measures are presented in Table 2.

In the publication A6,[22] 54 women were analyzed, with 30 in the LLLT intervention group and 29 in the placebo group. After multiple applications, a greater mean reduction in nipple pain was observed in the group receiving LLLT, as assessed by the Visual Analog Scale (VAS).

Study A7[23] evaluated breast pain in 80 women, with 40 assigned to the LLLT intervention group and 40 to the placebo group. Pain was monitored using the Visual Analog Scale (VAS) at three time points: at diagnosis, and at 6 and 24 hours after the initial application. Early LLLT application was associated with a greater reduction in pain at the time of diagnosis, while no consistent differences were observed during subsequent assessment periods.

Study A8[24] analyzed 105 nipple lesions in 54 lactating women who reported breastfeeding-related pain. The lesions were randomized into three groups: a control group, a local LLLT group, and an intravascular laser blood irradiation (ILIB) group—ILIB being a specific modality of low-level laser therapy. A reduction in both lesion size and pain before breastfeeding was observed in the intervention groups. However, since the unit of analysis was the lesion rather than the patient, and no adjustment for intra-subject dependence was performed, these findings should be interpreted with caution due to the risk of inflated statistical significance.

Table 1

General characteristics of the studies included in the systematic review.

Code	Title	Author/year	Objective	Results
A1	Acupoint-tuina therapy promotes lactation in postpartum women with insufficient milk production who underwent caesarean sections.	Lu *et al.*,[10] 2019	To evaluate the efficacy of Tuina massage on insufficient milk production in post-cesarean women.	Tuina therapy was associated with increased milk production, with statistically significant differences favoring the intervention group after 24 and 48 hours ($p \leq 0.05$).
A2	Effects of Gua-Sha therapy on breast engorgement: a randomized controlled trial.	Chiu *et al.*,[20] 2010	To evaluate Gua-sha therapy in postpartum women with breast engorgement, pain, and increased breast temperature.	Reduction in mean scores for engorgement, pain, and temperature, with greater improvement in the intervention group compared to control ($p \leq 0.05$).
A3	Effects of acupuncture and care interventions on the outcome of inflammatory symptoms of the breast in lactating women.	Kvist *et al.*,[21] 2004	To compare acupuncture, oxytocin spray, and traditional care regarding the reduction of breast inflammatory processes.	No statistically significant differences were found between the three groups(p=0.11) for breast inflammatory process after a three-day assessment.
A4	A randomised-controlled trial in Sweden of acupuncture and care interventions for the relief of inflammatory symptoms of the breast during lactation.	Kvist *et al.*,[14] 2007	To compare the use of oxytocin spray and acupuncture for the relief of inflammatory breast symptoms.	Acupuncture led to a reduction in the severity index of breast inflammation after the 3rd and 4th days (p<0.01) and decreased the need for antipyretics and warm compresses(p=0.01).
A5	Acupuncture treatment as breastfeeding support: preliminary data	Neri *et al.*,[11] 2011	To evaluate the efficacy of acupuncture on breastfeeding adherence during the first 3 months of life.	After 3 months, acupuncture increased the exclusive breastfeeding rate(OR=3.52; p<0.05).
A6	Efficacy of Low-Level Laser Therapy in Relieving Nipple Pain in Breastfeeding Women.	Coca *et al.*,[22] 2016	To evaluate LLLT for the reduction of breast pain.	There was a significant reduction in mean pain in the intervention group: - 2 [(95% CI: -3.6 to -0.4); p<0.05].
A7	The effect of a single irradiation of low-level laser on nipple pain in breastfeeding women: a randomized controlled trial	Camargo *et al.*,[23] 2019	To evaluate the effect of LLLT on breast pain in breastfeeding women with nipple lesions.	LLLT was significant (p<0.01) only at the time of pain diagnosis; no influence was observed at 6-hour and 24-hour applications compared to the placebo group.
A8	Low-Level Laser Therapy in the Healing and Analgesia of Nipple Lesions: A Clinical Trial	Curan *et al.*,[24] 2023	To analyze the efficacy of LLLT and ILIB on the healing and pain reduction of nipple lesions.	Pain reduction post-intervention before breastfeeding in the LLLT and ILIB groups, but no differences were observed during or after breastfeeding.
A9	Auricular acupressure on breast pain in breastfeeding mothers receiving gentle manual techniques: A randomized, single-blind, placebo-controlled trial	Han *et al.*,[25] 2024	To explore the efficacy of auricular acupressure for breast pain in breastfeeding mothers receiving standard gentle manual techniques.	After 4 weeks, numerical pain scale scores showed no significant change. However, the pressure pain threshold in the upper-left (Z= -2.202, p=0.028) and upper-right (t=2.613, p=0.012) areas of the right breast increased significantly in the intervention group.

Study A9[25] evaluated the effectiveness of auricular acupressure on breast pain in 52 lactating women, all of whom also received a standard gentle manual technique. Participants were randomized into an intervention group, receiving auricular acupressure at specific points related to breast pain and lactation, and a placebo control group, which received stimulation at non-specific points. Pain intensity was assessed using a Numerical Rating Scale

Table 2

Quantitative evidence by study and outcome.

Study	Outcome	Definition/Scale	Assessment Timepoint	Intervention (n)	Control (n)	Intervention Result	Control Result	Effect Measure (95%CI)	Remarks
Lu *et al.*,[10] 2019 (A1)	Milk production	Volume (ml)	24-48h post-intervention	ND	ND	Mean increase in milk production observed in the Tuina group	Lower milk production in the control group	Mean difference NR	95% CI NR
Chiu *et al.*,[20] 2010 (A2)	Reduction of breast engorgement	Numerical scale	5 min and 30 min post-intervention	27	27	Significant reduction	Smaller reduction	NR	Limited quantitative data
Kvist *et al.*,[21] 2004 (A3)	Inflammatory process	Clinical index	3rd day post-intervention	Two acupuncture groups	1 standard care group	No difference	NR	95% CI NR	No intergroup effect
Kvist *et al.*,[14] 2007 (A4)	Inflammatory severity	Clinical index	3-4 days	68/68 (acupuncture)	69 (Oxytocin spray or care)	Greater reduction	Smaller reduction	DM and 95% CI NR	Reduced use of antipyretics
Neri *et al.*,[11] 2011 (A5)	EBF	Proportion of women in EBF (yes/no) at 3 weeks and 3 months	3 weeks and 3 months after study onset	14/41 (acupuncture group)	7/43 (observation group)	3 weeks: 100% EBF 3 months: 35% EBF	3 weeks: 60% EBF 3 months: 15% EBF	NR in the original study OR 3.52 and 95% CI: 1.10-11.69	Intervention: 6 acupuncture sessions over 3 weeks. Control: observation and routine nursing care
Coca *et al.*,[22] 2016 (A6)	Nipple pain	VAS (0-10)	Before and 24h after the first application	30	29	Mean pain reduction of ~2.0 cm on VAS after 24h	Smaller reduction in the control group	MD – 1.5	95% CI reported
Camargo *et al.*,[23] 2019 (A7)	Nipple pain	VAS (0-10)	Pre-intervention; immediately post-irradiation; 6h-24h post-intervention	40	40	Mild pain reduction after application	Similar to the intervention group	MD not reported	Early effect only
Curan *et al.*,[24] 2023 (A8)	Nipple lesion size and pain intensity	Lesion area (mm2) and VAS	Pre-intervention and after 3 days of treatment	39 lesions (Local laser) and 31 (ILIB)	31 lesions	Significant reduction	Smaller reduction	MD not reported	Unit of analysis. = lesion
Han *et al.*,[25] 2024 (A9)	Subjective pain and pressure pain threshold	Numerical scale/ Algometry	4 weeks	26	26	NRs did not change significantly; smaller increase in pain threshold	NRs showed no significant change; smaller increase in pain threshold	Non-significant; notable statistical effect for pain threshold (p-value reported)	Subjective scale showed no effect
Curan *et al.*,[24] 2023 (A8)	Nipple lesion size and pain intensity	Lesion area (mm2) and VAS	Pre-intervention and after 3 days of treatment	39 lesions (Local laser) and 31 (ILIB)	31 lesions	Significant reduction	Smaller reduction	MD not reported	Unit of analysis. = lesion
Han *et al.*,[25] 2024 (A9)	Subjective pain and pressure pain threshold	Numerical scale/ Algometry	4 weeks	26	26	NRs did not change significantly; smaller increase in pain threshold	NRs showed no significant change; smaller increase in pain threshold	Non-significant; notable statistical effect for pain threshold (p-value reported)	Subjective scale showed no effect

MD = mean difference; OR = *odds ratio*; 95%CI = 95% confidence interval; NR = not reported.

(NRS) and pressure algometry before and after the four-week intervention. No significant reduction was found in subjective pain scores on the NRS. However, a statistically significant increase in the pressure pain threshold in the upper areas of the right breast was observed in the intervention group. Auricular acupressure showed potential as a complementary nursing intervention, although further research is needed to define the optimal frequency and duration of the treatment, especially for women with more severe pain, and to evaluate the sustainability of long-term effects.

Risk of bias assessment of included studies

The risk of bias assessment revealed methodological variability among the included studies (Figures 2 and 3). Five studies were classified as having an overall low risk of bias, as they demonstrated adequate randomization, satisfactory control of intervention deviations, complete data, and appropriate outcome measurement.

Three studies were classified as having some concerns, primarily due to the lack of blinding of participants and outcome assessors—a common limitation in manual interventions such as acupuncture, gua sha, and tuina—and an incomplete description of the randomization process.

One study was judged as having a high risk of bias due to substantial uncertainties regarding the randomization process, lack of allocation concealment, and the assessment of subjective outcomes by non-blinded assessors.

Overall, the domains most frequently associated with methodological concerns were those related to deviations from intended interventions and measurement of the outcome, which reduces confidence in the effect estimates presented.

Figure 3

Detailed risk of bias assessment of included studies, in accordance with the Cochrane RoB 2 tool domains.

A1 — Acupoint-tuina therapy promotes lactation in postpartum women with insufficient milk production who underwent caesarean sections (Lu et al.,[10] 2019)

D1: The article reports that there was participant allocation between the Tuina and control groups, and although there are no extensive details in the provided excerpt, there are no signs of failures in the randomization process or significant initial imbalance. The groups appear equivalent at the beginning of the study. Therefore, the judgment is low risk.
D2: The study involves a manual intervention (Tuina) applied by professionals. In addition, the article does not detail:

- whether there was rigorous monitoring of adherence;
- whether participants could have modified behaviors because they knew the group to which they belonged.

As it is a physical intervention and there are insufficient details to confirm adequate control of deviations, the judgment is some concerns.
D3: The summary does not state significant losses, dropouts, or incomplete data. The outcomes presented have complete data for the groups, with no suggestion of missing results that could alter the conclusions. Therefore, low risk.
D4: Although the outcomes include objective measures (serum PRL, milk volume, breast temperature), the article does not describe whether the assessors were blinded to the intervention group. In manual interventions, even partially objective outcomes may be influenced if:

- the assessor knows the group;
- there is no formal blinding;
- a standardized and blinded measurement method is not described.

The absence of this information generates uncertainty, leading to the classification of some concerns, even if the risk is not high.

The absence of this information generates uncertainty, leading to the classification of some concerns, even if the risk is not high.
D5: All outcomes mentioned in the methods were reported, and there are no signs of outcome selection, omissions, or protocol changes. Therefore, low risk.
OVERALL: Although there are two "SOME CONCERNS" categories, no domain was classified as high risk; therefore, there is no evidence of serious bias. In accordance with RoB 2, the overall judgment falls under LOW RISK.

A2 — EfEffects of Gua-Sha therapy on breast engorgement: randomized controlled trial (Chiu et al.,[20] 2010)

D1: The study is described as randomized, with equivalent groups at baseline and no signs of problems in sequence generation or allocation. Therefore, low risk.
D2: The Gua-Sha intervention does not allow for blinding of participants or practitioners. There is insufficient information regarding adherence control, supervision, or prevention of behaviors influenced by knowledge of the group. Therefore, some concerns.
D3: There is no report of losses, missing data, or dropouts that compromise the outcomes. Thus, low risk.
D4: Although some of the outcomes are objective, others such as pain, discomfort, and engorgement scores are subjective and may be influenced. The article does not describe any form of blinding of the assessors, which introduces the possibility of:

- assessment influenced by knowledge of the group;
- professional expectations regarding Gua-Sha;
- non-standardized subjective measurement.

This lack of information prevents stating that the risk is low. Thus, some concerns.
D5: All announced outcomes were presented, with no signs of selectivity. Classified as low risk.
OVERALL: Although D2 and D4 present "some concerns," there are no critical domains or serious risks of bias, maintaining the global judgment as LOW RISK.

A3 — Effects of acupuncture and care interventions on inflammatory symptoms of the breast... (Kvist et al.,[21] 2004)

D1: The study reports randomization among three groups, and there are no signs of initial imbalances. Therefore, low risk.
D2: Non-blinded interventions; possibility of influence on participants' behavior or perception. Presents some concerns.
D3: No relevant losses reported; data considered complete; presents low risk.
D4: Subjective outcomes (pain, erythema, tension) and absence of assessor blinding. Evidences some concerns.
D5: All described outcomes were presented; no signs of selectivity; presents low risk.
OVERALL: Some concerns.

A4 — A randomised-controlled trial in Sweden of acupuncture and care interventions... (Kvist et al.,[14] 2007)

D1: Randomization was insufficiently described and there is no clear information regarding allocation concealment. Since the study is non-blinded and conducted in a lactation clinic (with direct interaction between professional and patient), there is a real possibility of predictability in allocation. It is classified as high risk.
D2: The study is non-blinded, and participants knew whether or not they were receiving acupuncture. This may influence behavior, adherence, and perception of the interventions, generating a potential for deviations that are not fully controlled. Therefore, some concerns.
D3: Low dropout rate and absence of relevant differences between groups regarding incomplete data. Presents low risk.
D4: Assessment performed by non-blinded professionals, with subjective outcomes (pain, tension), which may introduce measurement bias. Therefore, some concerns.
D5: Pre-defined outcomes were reported in a complete and coherent manner with the protocol. Therefore, low risk.
OVERALL: Study A4 was classified as having a HIGH RISK OF BIAS, due to uncertainties in the randomization process and allocation concealment (D1), as well as limitations in blinding and outcome measurement (D2 and D4). Although missing data and outcome reporting showed no signs of significant bias, the failure to clearly describe critical randomization items justifies the overall judgment of high risk of bias.

A5 — Acupuncture treatment as breastfeeding support: preliminary data (Neri et al.,[11] 2011)

D1: Randomization described and without apparent initial imbalance; low risk.
D2: Lack of blinding of participants and the midwife → possible influence on behavior and adherence. Therefore, some concerns.
D3: Low dropouts and adequate follow-up, without relevant differences between groups; low risk.
D4: Outcomes assessed by a non-blinded professional; part of the assessment is subjective; some concerns.
D5: The study did not present a prior protocol registration, increasing uncertainty regarding the selection and prioritization of the reported outcomes. Therefore, some concerns.
OVERALL: SOME CONCERNS, as there are crucial methodological limitations that do not completely invalidate the study but attenuate the reliability of the findings.

A6 — Efficacy of Low-Level Laser Therapy in Relieving Nipple Pain in Breastfeeding Women (Coca et al.,[22] 2016)

D1: Randomization is described, with similar groups at baseline and adequate concealment through a triple-blind strategy; therefore, there is a low probability of predictable sequences. Low risk.
D2: The study was triple-blinded (participants, practitioners, and assessors), reducing the risk of differentiated behaviors or co-interventions between groups. Classified as low risk.
D3: There were no significant losses, and the analyses included practically all randomized participants; low risk.
D4: The primary outcome (nipple pain) was measured using the VAS (visual analogue scale), a standard and validated instrument. Since the study was triple-blinded, the participant did not know whether they were in the laser or control group, reducing influence on the response. The assessor was also blinded, avoiding measurement bias. Low risk.
D5: The study clearly described the objective (to assess pain) and reported exactly that outcome. There are no indications of selective omission of results. There are no signs that only "favorable results" were presented. Classified as low risk.
OVERALL: Article 6 presents: adequate randomization, robust blinding, no relevant missing data, valid outcome measurement, and transparent reporting. Therefore, LOW RISK.

A7 — The effect of a single irradiation of low-level laser on nipple pain...: a randomized controlled trial (Camargo et al.,[23] 2019)

D1: The study is a randomized, double-blind clinical trial; 40 women were allocated to the laser group and 40 to the control group. The summary does not describe exactly how the randomization was performed, but: I. there are no signs of serious imbalance between groups; II. there is no indication of interference in the allocation. Therefore, D1 is low risk.
D2: The study is double-blind, so: I. participants did not know which treatment they received; II. assessors also did not know. Such dynamics reduce the possibility of voluntary behavior changes or clinical management influencing the result. There were no extra treatments or changes reported. Therefore, low risk.
D3: Losses were minimal; the loss in the laser group was low and there was no apparent influence on the effect, given that the outcome is immediate and short-term, and it is not a long-term outcome where losses would be detrimental. Classified as low risk.
D4: The use of the Visual Analogue Scale (VAS), associated with double-blinding, ensured an adequate and standardized assessment of pain, reducing potential measurement biases. Thus, low risk.
D5: The authors presented all expected results, including the primary outcome and additional assessments, with no indications of selective reporting. Low risk.
OVERALL: The set of domains indicates that the study presents adequate methodological rigor and low risk of bias in its entirety. Classified as LOW RISK.

A8 — Laser de Baixa Potência na Cicatrização e Analgesia de Lesões Mamilares: Ensaio Clínico (Curan et al.,[24] 2023)

D1: Although the study is described as randomized, there is no information on how the sequence was generated or whether there was allocation concealment. This prevents confirming that the randomization was adequate. It falls under some concerns.
D2: The study does not describe whether participants or assessors were blinded, which may influence behavior during the intervention or the perception of pain, generating moderate uncertainties. The domain presents some concerns.
D3: There are no relevant losses of participants and the outcomes were assessed for practically all women, reducing the chance of bias due to incomplete data. The risk of bias is low.
D4: Pain and healing outcomes may be influenced by subjectivity or the lack of blinding of the assessors, which generates uncertainty about the impartiality of the measurement. The domain presents some concerns.
D5: LOW RISK, as the results were presented in a complete and consistent manner with what was proposed in the protocol described in the summary, without signs of selective omission.
OVERALL: Although the study has a good methodological structure, the gaps in the description of randomization, the control of intervention deviations, and the measurement of outcomes increase the level of uncertainty. Thus, the global risk is not low, but moderate, compatible with "SOME CONCERNS".

A9 — Acupressão auricular na dor mamária... ensaio clínico randomizado, simples-cego e controlado por placebo (Han et al.,[25] 2024)

D1: The study mentions randomization; however, it does not describe in detail how the sequence was generated or concealed. The lack of transparency prevents confirming whether the allocation was entirely free of bias. It presents some concerns.
D2: There is no clarity regarding the degree of blinding of participants or practitioners, which may allow for differences in how the intervention was administered or perceived. The domain presents some concerns.
D3: The study does not indicate significant or imbalanced losses between the groups, and essential data were analyzed. Nothing suggests that missing data impacted the results. Considered low risk.
D4: This domain presents some concerns because, despite using subjective and objective measures, there is no confirmation of assessor blinding, which may introduce measurement bias, especially in the pain scale.
D5: The primary outcomes were presented transparently and consistently with the described methods. There are no signs of selective reporting. Considered low risk.
OVERALL: Although some domains are low risk, it is worth noting the uncertainty regarding randomization, blinding, and outcome measurement, leading the article to present SOME CONCERNS.

Each study was assessed regarding the five risk of bias domains, being classified as "low risk of bias", "some concerns", or "high risk of bias", according to the methodological recommendations of the Cochrane Collaboration.

Source: prepared by the authors, 2025.

Discussion

The findings of this systematic review can be grouped into three major categories: the use of manual acupuncture; the application of LLLT or ILIB for breast pain or lesions; and the use of other techniques derived from the acupuncture meridian system. In all cases, the available evidence is limited and marked by methodological heterogeneity, which warrants caution when interpreting the findings.

LLLT showed divergent results among the included studies. One study observed no significant difference after a single application,[23] while two studies reported a reduction in pain associated with laser therapy.[22,24] However, the trials were limited by small sample sizes, varying protocols, and short follow-up periods, which restricts the robustness of the conclusions and hinders direct comparison between results.

Acupuncture was employed through various modalities, including manual acupuncture, tuina, and gua sha, and was compared to control groups or other interventions, such as oxytocin spray. Gua sha demonstrated pain reduction compared to a control group,[20] while tuina was associated with increased milk production in another study.[10] In a separate trial, manual acupuncture was associated with improved rates of exclusive breastfeeding.[11] Conversely, one study found no significant differences between the use of oxytocin spray and acupuncture protocols.[21] The variability in techniques, point selection, and evaluated outcomes contributes to the observed heterogeneity and limits the generalizability of these findings.

Regarding LLLT and ILIB, the review identified three studies, two of which evaluated pain reduction following laser therapy, notwithstanding methodological differences. In one study, pain reduction was more evident after the second irradiation session.[22] Another trial showed significant differences between LLLT/ILIB and the control group prior to breastfeeding, yet no significant difference was found when comparing these two interventions against each other.[24] However, the third study found no differences between a single LLLT session and the control group concerning pain reduction in women with nipple lesions.[23] Such heterogeneity limits comparisons between trials and reinforces the need for standardized protocols and larger sample sizes.

In one of the included studies (A8[24]), the unit of analysis was the breast lesion rather than the individual participant. In this design, multiple lesions from the same woman may have been analyzed as independent observations, posing a risk of intra-subject dependence. Consequently, this approach violates the assumption of independence of observations and may result in an overestimation of statistical significance and an artificial narrowing of confidence intervals. The study did not report the use of statistical methods for cluster adjustment,

such as hierarchical models or corrections for intraclass correlation. Thus, although the results indicate a reduction in pre-breastfeeding pain and lesion size in the intervention groups, the certainty of these findings was downgraded in this systematic review. Therefore, the observed effects must be interpreted with caution, as exploratory and hypothesis-generating, rather than as robust evidence of clinical efficacy.

Regarding the risk of bias, several studies exhibited critical limitations, particularly concerning the blinding of participants and personnel, which is inherently challenging in interventions such as acupuncture and massage. Only two publications implemented adequate blinding strategies. These methodological shortcomings, coupled with small sample sizes and the risk of selection bias, diminish the confidence in the reported effect estimates.

Breastfeeding, although extensively studied, remains a notable challenge in Brazil, with high rates of early weaning influenced significantly by nipple trauma and pain, among other factors related to breastfeeding management.[26] The outcome of maintaining exclusive breastfeeding showed a significant increase with the use of acupuncture in one of the studies.[11] It is noteworthy that relatively simple application strategies, such as tuina, gua sha, and other massage techniques,[10,20] could be integrated into postpartum care practices. However, these findings should be interpreted as hypotheses for future research; they do not yet support formal clinical recommendations or health technology adoption decisions.

Despite preliminary evidence of benefit observed in some studies, the available data is limited, heterogeneous, and based on a small number of clinical trials—many characterized by small sample sizes and some concerns regarding the risk of bias. Therefore, the results should be interpreted descriptively and do not support formal clinical recommendations. It is important to emphasize that the observed effects of LLLT and ILIB primarily relate to breast pain reduction and lesion healing, whereas the impacts on the maintenance of exclusive breastfeeding are indirect and based on a limited number of studies. Future clinical trials with greater methodological standardization and combined assessment of interventions are required to confirm these findings.

Final considerations

This systematic review synthetized the available evidence regarding the use of acupuncture, low-level laser therapy (LLLT), and intravascular laser blood irradiation (ILIB) in the management of breast pain and nipple lesions, and breastfeeding-related outcomes. Overall, several studies reported positive effects from these interventions, particularly concerning pain relief and lesion healing. Furthermore, sporadic indications of a favorable impact were observed regarding milk production and the maintenance of exclusive breastfeeding (EBF).

However, the available studies are limited and marked by methodological heterogeneity, variability in intervention protocols, small sample sizes, and moderate to high risk of bias across a portion of the included studies. Moreover, specific limitations – such as the use of non-independent units of analysis in one study and the lack of adequate statistical adjustments – diminish the reliability of certain findings.

Therefore, the results obtained in this review do not support formal clinical recommendations, nor health technology adoption decisions. The findings should be interpreted cautiously and descriptively, being considered exploratory and hypothesis-generating. Further studies with more robust methodological designs, greater standardization of interventions, adequate sample sizes, and rigorous outcome assessments are essential to clarify the effectiveness of the aforementioned therapies within the context of breastfeeding.

Author's contribution

Lima DL: conceptualization, systematic review structuring, study selection, data analysis, and manuscript writing.

Soares RS: systematic review structuring, supervision of the writing process, review and study selection, risk of bias assessment, manuscript review.

Macedo PO, Freitas ES, Souza IG, Pedro IKF: peer review of study selection, interpretation of findings, manuscript review.

Araújo JSS: project coordination and supervision of the systematic review structuring, manuscript review.

All authors approved the final version of the article and declare no conflicts of interest.

Data availability

All data analyzed in this systematic review were extracted from previously published studies and are available in the searched databases.

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Supplemental Chart 1

Full search strategies executed as described,without subsequent adaptations,on October 15,2025.

PUBMED/MEDLINE	***(("Nipples"[MeSH] OR "Mastodynia"[MeSH] OR "Breast Feeding"[MeSH])*** ***AND*** ***("Acupuncture Therapy"[MeSH] OR "Acupuncture"[MeSH] OR "Low-Level Light Therapy"[MeSH] OR "Acupressure"[MeSH]))*** Filters applied: Humans; English, Portuguese, Spanish, French, and Italian languages.
VIRTUAL HEALTH LIBRARY (VHL – LILACS, IBECS, BDENF)	***((mh:(Mamilos) OR mh:(Mastodinia) OR mh:(Aleitamento))*** ***AND*** ***(mh:(Acupuntura) OR mh:(Acupressão) OR mh:(Acupotomia) OR mh:(LLLT)))*** Filters applied: Portuguese, English, Spanish, French, and Italian languages.
SCIELO	***((Aleitamento OR Mamilo OR Mastodinia)*** ***AND*** ***(Laser OR "Laser de baixa intensidade" OR Acupuntura OR Acupressão))*** Filters: no additional filters applied.